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**Chapter 4:**

Sect. 4.1 # 1-4, 17-22 (make good graphs including coordinates)

Sect. 4.1 #5-8, 15, 16, 23-33(odd)

Sect. 4.2 #5-8, 35-42

Sect. 4.2 #15 - 20(odd) (no graphs), 23 - 33 (odd) (graphs)

Sect. 4.1 #5-11, 24-32(even), 37, 38, 41a-c

Sect. 4.2 #6-34(even, 47(not f), 48(not e)

Sect 4.3 #1-6, 7-20(3), 21-32(3), 33-46(2) 49, 50

Sect. 4.3 Do 5 more problems to get solid

"Quiz" (4 problems we did in class, see the [lesson](#))

1st page of Sinusoidal Application [handout](#)

All but very last page of Sinusoidal Application [handout](#).

**Chapter 5:**

Sect. 5.1 #1-8, 21, 29-38

Sect. 5.2 #1-3, 13-19, 23-25, 27, 29

Sect. 5.2 #41, 42, 44, 49, 61, 63, 67, 69

Sect. 5.2 #33, 39, 50, 59, 66

Due today  
by 1:00

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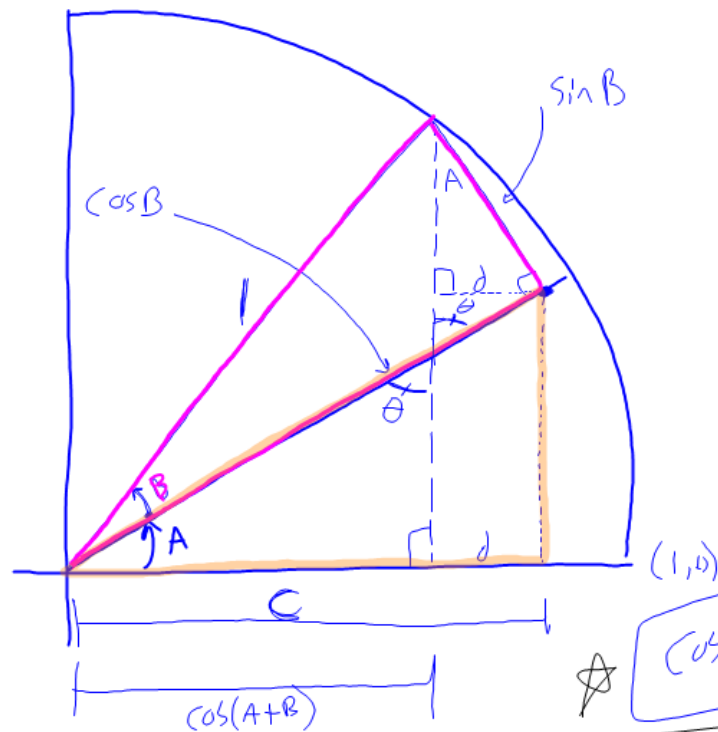
Done

## P.189 - Hints

- put things in terms of sin & cosine
  - Any time you see squared think pythagorean identities
- 
- $\left\{ \begin{array}{l} 1 + \sin x \text{ or } 1 - \sin x, \text{ think conjugate} \\ (1 - \sin x) \quad (1 + \sin x) \end{array} \right.$
  - Difference of Squares  $1 - \sin^2 x \rightarrow \cos^2 x$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B \quad \text{Cosine Sum identity}$$

$$\cos(A+B) = c - d$$



$$A+B=90^\circ$$

$$\sin A = \frac{d}{\sin B}$$

$$d = \sin A \sin B$$

$$\cos A = \frac{c}{\cos B}$$

$$c = \cos A \cos B$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

Q.E.D.

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

These identities are important in calculus and useful in certain applications. Although a calculator can be used to find an approximation for  $\cos 15^\circ$ , for example, the method shown below can be applied to get an exact value, as well as to practice using the sum and difference identities.

30, 45, 60

### EXAMPLE 1 Finding Exact Cosine Function Values

Find the *exact* value of each expression.

(a)  $\cos 15^\circ$

(b)  $\cos \frac{5\pi}{12}$

$$\begin{aligned} \cos(45 - 30) &= \cos(15) \\ &= \cos 45 \cdot \cos 30 + \sin 45 \sin 30 \\ \text{(c) } \cos 87^\circ \cos 93^\circ - \sin 87^\circ \sin 93^\circ \\ &= \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6} + \sqrt{2}}{4} \end{aligned}$$

### Solution

(a) To find  $\cos 15^\circ$ , we write  $15^\circ$  as the sum or difference of two angles with known function values. Since we know the exact trigonometric function values of  $45^\circ$  and  $30^\circ$ , we write  $15^\circ$  as  $45^\circ - 30^\circ$ . (We could also use  $60^\circ - 45^\circ$ .) Then we use the cosine difference identity.

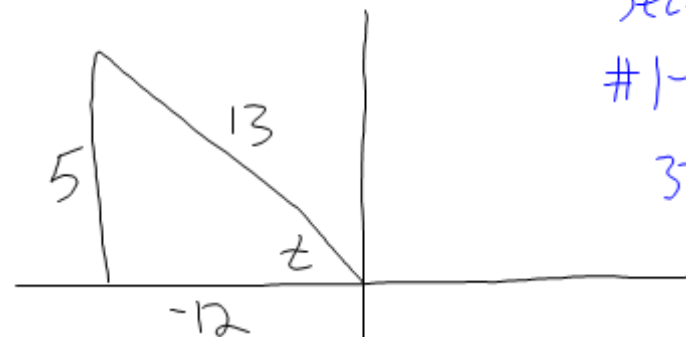
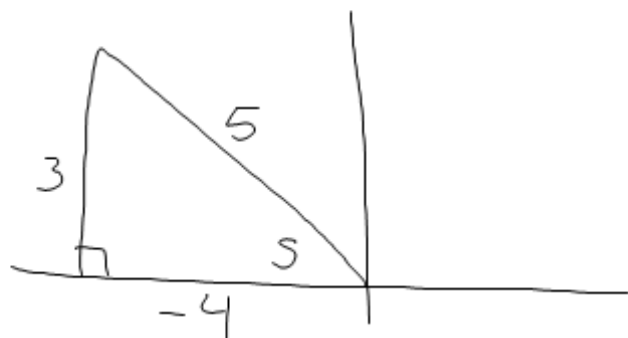
$$\sin s = \frac{3}{5} \quad \cos t = -\frac{12}{13}, \text{ Quad II} \quad \text{Find } \cos(s+t)$$

#W

Sect. 5.3

#1-7, 9, 11, 15-17,

33, 34, 47-49



$$\cos(s+t) = \cos(s)\cos(t) - \sin(s)\sin(t)$$

$$= \underbrace{-\frac{4}{5}}_{\substack{\downarrow \\ \text{adjacent}}} \cdot \underbrace{-\frac{12}{13}}_{\substack{\downarrow \\ \text{adjacent}}} - \frac{3}{5} \cdot \frac{5}{13} = \frac{48}{65} - \frac{15}{65} = \frac{33}{65}$$

$$30^\circ = \frac{\pi}{6} = \frac{2\pi}{12}$$

$$45^\circ = \frac{\pi}{4} = \frac{3\pi}{12}$$

$$60^\circ = \frac{\pi}{3} = \frac{4\pi}{12}$$

$$\frac{7\pi}{12} = \frac{3\pi}{12} + \frac{4\pi}{12}$$